IN THE CLAIMS

1. (currently amended) A regenerative pumping mechanism comprising

a rotor having a series of blades positioned in an annular array on one side of the rotor and extending axially into an annular channel of a stator within which the blades rotate, and

means for actively controlling relative axial movement between the rotor and the stator so as to control the axial clearance between the rotor and the stator wherein the means for actively controlling relative axial movement comprises an axial magnetic bearing having an electromagnet arranged to draw the rotor towards the stator; and

wherein the electromagnet is mounted on the stator of the regenerative pumping mechanism.

Claims 2-3 (canceled)

4. (currently amended) The mechanism according to claim ~~3~~ 1 wherein the electromagnet is integrally mounted ~~on~~ in the stator of the regenerative pumping mechanism.

5. (currently amended) The mechanism according to claim ~~3~~ 1 wherein the axial magnetic bearing comprises a second electromagnet arranged to draw the rotor away from the stator.

6. (original) The mechanism according to claim 5 wherein the axial magnetic bearing comprises a magnetic bearing rotor, and the magnetic bearing rotor and the rotor of the regenerative mechanism are positioned on a common shaft, and wherein the magnetic bearing rotor is positioned between the first and second electromagnets.

7. (currently amended) The mechanism according to claim ~~3~~ 1 comprising control means for controlling the strength of the magnetic field generated by the electromagnet.

8. (original) The mechanism according to claim 1 wherein the means for actively controlling axial movement comprises an actuator actuable to control the axial position of the rotor.

9. (original) The mechanism according to claim 8 wherein the actuator comprises a magnetostrictive material.

10. (original) The mechanism according to claim 9 comprising control means for controlling the strength of a magnetic field applied to the actuator to control the shape of the actuator so as to control the axial position of the rotor relative to the stator.

11. (original) The mechanism according to claim 8 comprising control means for controlling actuation of the actuator so as to control the axial position of the rotor relative to the stator.

12. (original) The mechanism according to claim 7 wherein the control means comprises means for detecting the axial position of the rotor relative to the stator.

13. (original) The mechanism according to claim 1 comprising means for limiting the amount of relative movement between the rotor and the stator.

14. (original) The mechanism according to claim 1 wherein at least one of the rotor and the stator comprises a wear-resistant material.

15. (original) The mechanism according to claim 1 wherein the rotor has two series of blades positioned in concentric annular arrays on a side of the rotor and wherein the stator has a corresponding number of channels within which the blades of the arrays can rotates and further comprising a passageway connecting the channels through which fluid can pass.

16. (original) The mechanism according to claim 1 comprising a drive shaft for driving the mechanism.

17. (original) The mechanism according to claim 16 wherein the drive shaft is supported at each end thereof by a lubricant free bearing.

18. (original) The mechanism according to claim 17 wherein each lubricant free bearing

comprises a magnetic bearing.

19. (original) The mechanism according to claim 16 wherein the drive shaft is supported at each end by a rolling bearing.

20. (original) The mechanism according to claims 16 wherein the means for actively controlling relative axial movement is arranged to control axial movement of the drive shaft and so as to control the axial position of the rotor relative to the stator.

21. (currently amended) A regenerative pumping mechanism comprising:

a rotor having a series of blades positioned in an annular array on one side of the rotor and extending axially into an annular channel of a stator within which the blades rotate;

means for actively controlling relative axial movement between the rotor and the stator so as to control the axial clearance between the rotor and the stator; and

a drive shaft for driving the mechanism wherein the drive shaft is supported at each end by a rolling bearing; and ~~The mechanism according to claim 19~~

wherein the means for actively controlling relative axial movement is arranged to axially move at least one of said rolling bearing so as to control the axial position of the drive shaft.

22. (currently amended) A pumping arrangement comprising:

a regenerative pumping mechanism comprising a rotor having a series of blades positioned in an annular array on one side of the rotor and extending axially into an annular channel of a stator within which the blades rotate~~,~~; and

means for actively controlling relative axial movement between the rotor and the stator so as to control the axial clearance between the rotor and the stator wherein the means for actively controlling relative axial movement comprises an axial magnetic bearing having an electromagnet arranged to draw the rotor towards the stator; and

wherein the electromagnet is mounted on the stator of the regenerative pumping mechanism.

23. (canceled)

24. (currently amended) A pumping arrangement for controlling pressure in a chamber, the arrangement comprising:

a regenerative pumping mechanism comprising:

a rotor having a series of blades positioned in an annular array on one side of the rotor, and a stator having an annular channel within which the blades rotate; and

means for effecting relative axial movement between the rotor and the stator during use of the pump to control the axial clearance between the rotor and the stator and so control the pressure in the chamber wherein the means for effecting relative axial movement comprises an axial magnetic bearing having an electromagnet arranged to draw the rotor towards the stator; and

wherein the electromagnet is mounted on the stator of the regenerative pumping mechanism.

25. (original) The pumping arrangement according to claim 24 comprising a drive shaft for driving the mechanism, and wherein the means for actively controlling relative axial movement is arranged to control axial movement of the drive shaft so as to control the axial position of the rotor relative to the stator.

26. (canceled)

27. (original) The pumping arrangement according to claim 25 wherein the means for effecting relative axial movement comprises an actuator actuable to control the axial position of the rotor relative to the stator.

28. (currently amended) The pumping arrangement according to claim ~~25~~ 27 wherein the actuator is arranged to move a bearing for supporting the drive shaft.

29. (canceled)

30. (original) The pumping arrangement according to claim 24 wherein the means for effecting

relative axial movement comprises an actuator actuable to control the axial position of the rotor relative to the stator.

31. (currently amended) The pumping arrangement according to claim ~~27~~ 30 wherein the actuator is arranged to move a bearing for supporting the drive shaft.

32. (original) The mechanism according to claim 11 wherein the control means comprises means for detecting the axial position of the rotor relative to the stator.